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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,598	07/20/2006	Tadashi Maeda	2006_1151A	1659

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EXAMINER

MEHTA, MEGHA S

ART UNIT	PAPER NUMBER
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1793

NOTIFICATION DATE	DELIVERY MODE
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04/15/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/586,598	Applicant(s) MAEDA ET AL.	
	Examiner MEGHA MEHTA	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 January 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-39 is/are pending in the application.
- 4a) Of the above claim(s) 16-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 27-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/12/2010</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 27-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,189,771 Maeda et al in view of US 2002/0185309 Imamura et al.

Regarding claim 27, Maeda teaches a soldering process with which a first electrode having a solder portion **9** thereon is soldered to a second electrode **1** (column 1, lines 13-16), wherein the process comprises, a first step of supplying a flux (in **5**) to at least one of the solder portion and the second electrode (column 4, lines 1-8), a second step of aligning the first electrode with the second electrode so as to locate the flux between the solder portion and the second electrode (column 5, lines 26-28), a third step of heating so as to melt the solder portion, so that a molten solder material from the solder portion comes in contact with the second electrode (column 5, lines 32-35). Maeda does not explicitly teach the fourth step of solidifying the molten solder material after the third step. However, this would have been obvious to one of ordinary skill in the art at the time of the invention because the purpose of solder is to adhere two pieces together and a liquid solder would not suffice.

Maeda additionally does not teach the flux composition.

Imamura teaches a method of mounting an electronic component with solder bumps to a substrate by using a flux that comprises a liquid base material **118** comprising a resin component

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which is dissolved in a solvent (paragraph 0066), an active component which removes an oxide (paragraph 0066), and a metal powder **116** made of a metal of which melting point is higher than that of a solder material which forms the solder portion **112** (paragraph 0064), where the metal powder is in the form of scales, and the flux contains the metal powder in an amount in the range between 1% and 9% by volume based on a volume of the flux (paragraph [0078]), where “scales” are defined by dictionary.com as “any thin, platelike piece, lamina, or flake.” With this broadest reasonable interpretation, metal powder particulates are taken to satisfy the “form of scales” limitation.

It would have been obvious to one of ordinary skill in the art to include the flux of Imamura in the method of Maeda because one may vary the flux composition based on the desired final result and the effect of the flux on the product being made.

Regarding claim 28, Maeda teaches the solder portion is a bump which is formed on the first electrode (column 5, lines 15-22).

Regarding claim 29, Maeda teaches that the first electrode is an external connection electrode of an electronic part (column 5, lines 15-22).

Regarding claim 30, Maeda teaches that the second electrode is an electrode of a circuit formed on a substrate.

Regarding claim 31, Maeda teaches supplying the flux carried out in a flux application step wherein a film of the flux is formed, and then a lower end portion of the solder portion is made in contact with the film (column 4, line 58 – column 5, line 1 and figure 4A).

Regarding claim 32, Maeda teaches the soldering process but does not explicitly teach a cooling step. However, it would have been obvious to one of ordinary skill in the art at the time

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of the invention to solidify the molten solder material through a cooling step wherein the molten solder material is cooled because cooling and thus solidifying the solder is the only way for the solder to hold two pieces together.

Regarding claim 33, Maeda in view of Imamura teach the majority of the limitations with respect to claim 27 above. Imamura further teaches a metal powder **116** of which constituting elements are comprised of cores and coatings around the cores, wherein the coatings are made of a metal of which melting point is higher than that of a solder material which forms the solder portion **112** (paragraph 0064).

Imamura's metal grains are reasonably taken to be "cores and coatings around the cores". While this is not explicitly taught, the grains may be viewed as spherulites growing into grains, where the spherulite is the core and the growing layers are the coatings. Additionally, one may take one of Imamura's spherical metal grains and arbitrarily define an "inside portion of the grain" and "an outside portion of the grain" where the inside is the core and the outside is the coating. There is no claim limitation that the coating must be visibly distinct from or a different material than the core.

Regarding claims 34, Maeda teaches the solder portion is a bump which is formed on the first electrode (column 5, lines 15-22).

Regarding claim 35, Maeda teaches that the first electrode is an external connection electrode of an electronic part (column 5, lines 15-22).

Regarding claim 36, Maeda teaches that the second electrode is an electrode of a circuit formed on a substrate.

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Regarding claim 37, Maeda teaches supplying the flux carried out in a flux application step wherein a film of the flux is formed, and then a lower end portion of the solder portion is made in contact with the film (column 4, line 58 – column 5, line 1 and figure 4A).

Regarding claim 38, Maeda teaches the soldering process but does not explicitly teach a cooling step. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to solidify the molten solder material through a cooling step wherein the molten solder material is cooled because cooling and thus solidifying the solder is the only way for the solder to hold two pieces together.

Regarding claim 39, Maeda teaches that the cores are made of tin and the coatings are made of silver (column 4, lines 40-43), where “made of” is broadly interpreted as “comprising” and as there is no clear distinction between the coatings and the cores, both the coatings and the cores include tin and silver.

Response to Arguments

3. Applicant's arguments with respect to Sugimoto have been considered but are moot in view of the new ground(s) of rejection.

4. Applicant's arguments filed August 7, 2009, have been fully considered but they are not persuasive.

Applicant argues that Imamura teaches away from scale-shaped particles because Imamura discloses spherical particles. However, one reading paragraph 0070 would be able to appreciate that while Imamura states that the particles “may” have a smooth surface, spherical is just one example of such a particle, and Imamura is clearly not excluding other smooth particles (or particles that do not necessarily have a smooth surface...note use of the word “may”). One

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reading the entire reference a whole, with particular focus on Paragraph 0038, would readily appreciate that any metal particle having a smooth shape is suitable for the flux. Even if it were taken that spherical particles are critical to Imamura's flux, it is the Examiner's position that spherical particles can be characterized as scales. The term "scales" does not necessitate the thickness of the particle to be thin with respect to the width of the particle, only that the thickness is thin relative to any other point of reference. This interpretation allows even spherical particles to be scales as the diameter of the particle is relatively small.

Applicant argues that the new claim 39 requires the core and the coating of claim 33 to be made of different materials. However, "made of," as explained above, is interpreted as "comprising." This open language allows the tin and silver to be in other parts of the particle as long as there is some tin in the core and some silver in the coating. This allows a tin-silver alloy particle to meet the limitations of the claim.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MEGHA MEHTA whose telephone number is (571)270-3598.

The examiner can normally be reached on Monday to Friday 7:30 am to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on 571-272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Megha Mehta/
Examiner, Art Unit 1793

/Jessica L. Ward/
Supervisory Patent Examiner, Art Unit 1793